

DOCUMENT RESUME

ED 148 819

95

SP 012 115

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TITLE The Generality-Specificity of Encoding and Decoding Skills with Spontaneous and Deliberate Nonverbal Behavior. Technical Report No. 443.
INSTITUTION Wisconsin Univ., Madison. Research and Development Center for Cognitive Learning.
SPONS AGENCY National Inst. of Education (DHEW), Washington, D.C.
PUB DATE Dec 77
CONTRACT NE-C-00-3-0063
NOTE 40p.
EDRS PRICE MF-\$0.83 HC-\$2.06 Plus Postage.
DESCRIPTORS *Behavioral Science Research; *Interpretive Skills; *Nonverbal Communication; *Observation; *Research Skills; Spontaneous Behavior
IDENTIFIERS Deliberate Behavior; *Observer Accuracy

ABSTRACT

This experiment was designed to investigate the generality-specificity of the accuracy of both encoders and decoders across different types of nonverbal behavior. It was expected that encoders and decoders would exhibit generality in their behavior--i.e., the same level of accuracy--on the dimension of behavior content (comprehension/noncomprehension). Less generality of accuracy was expected on the dimension of mode of behavior (spontaneous/role play). Contrary to predictions, results indicated a high degree of specificity across both content and mode of behavior when the data were analyzed separately for encoders and decoders. These findings seriously question the conclusion of previous reports suggesting high generality in the encoding and decoding of nonverbal behavior. Instead, individuals appear to be quite situation-specific in their ability to encode and decode nonverbal behavior. A theoretical interpretation of the results is offered. (Author)

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Technical Report No. 443

THE GENERALITY-SPECIFICITY OF ENCODING AND DECODING SKILLS
WITH SPONTANEOUS AND DELIBERATE NONVERBAL BEHAVIOR

by

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Report from the Project on
Studies of Instructional Programming for
the Individual Student

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December 1977

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Center Contract No. NE-C-00-3-0065

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The Wisconsin Research and Development Center is supported with funds from the National Institute of Education and the University of Wisconsin.

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ABSTRACT

This experiment was designed to investigate the generality-specificity of the accuracy of both encoders and decoders across different types of nonverbal behavior. It was expected that encoders and decoders would exhibit generality in their behavior--that is, the same level of accuracy--on the dimension of behavior content (comprehension/noncomprehension). Less generality of accuracy was expected on the dimension of mode of behavior (spontaneous/role play). Contrary to predictions, results indicated a high degree of specificity across both content and mode of behavior when the data were analyzed separately for encoders and decoders. These findings seriously question the conclusion of previous reports suggesting high generality in the encoding and decoding of nonverbal behavior. Instead, individuals appear to be quite situation-specific in their ability to encode and decode nonverbal behavior. A theoretical interpretation of the results was offered.

INTRODUCTION

Early research on the relation between spontaneous (natural or unintended) and deliberate (posed or role play) nonverbal behavior yielded equivocal results. Landis (1929) reported that observers could not accurately identify either spontaneously or deliberately encoded emotions. On the other hand, Coleman (1949) found that subjects were able to decode both spontaneous and posed expressions quite accurately. The validity of both findings is questionable, however, since only a few subjects were used in the studies ($N = 3$ and $N = 2$).

Recently, more satisfactory experiments have been conducted by Buck (1975) and by Zuckerman, Hall, Defrank, and Rosenthal (1976). In the Buck experiment, pre-school children were asked to encode various facial expressions both spontaneously and by role playing. College student observers decoded the spontaneous behavior and then rated the appropriateness of the deliberately produced expressions. Analysis revealed a significant (though small) correlation between accuracy in the encoding of spontaneous and deliberate behavior. Unfortunately, the observers did not actually decode the deliberate behavior, but merely rated its appropriateness. This procedure necessitates informing the observers of the type of expression they will see. Consequently, interpretation of the results is very difficult because this knowledge may influence the judges' ratings of the deliberate behavior.

The most adequate research on the relation between spontaneous and deliberate behavior was reported by Zuckerman et al. (1976). Subjects were secretly videotaped while watching each of four 30-second, emotion-arousing scenes. Two scenes were associated with pleasant affect (comedy, adult-child interaction) and two with unpleasant affect (murder, traffic accident). Bogus physiological data were presumably obtained. Following this initial encoding session, the true purpose of the study was explained to the subjects. The experimenter then described the scenes the subjects had just witnessed and asked them to portray deliberately (pose) their reactions to each scene. Again, the encoders were videotaped¹, and all the videotapes were later decoded by the same subjects. Results revealed that persons who encoded well spontaneously were also good encoders when asked to portray deliberately a given type of behavior ($r = .46$, $p < .001$). A similar result was also observed for the decoders: persons who accurately identified spontaneous behavior were also more correct with deliberate behavior ($r = .58$, $p < .001$). Zuckerman et al. suggest that spontaneous and deliberate encoding may involve similar skills and, furthermore, that the actual nonverbal cues associated with deliberate behavior may closely resemble their spontaneous counterparts.

It is reasonable to expect that some degree of similarity would exist between spontaneous and deliberate nonverbal behavior. Both modes of encoding require that the sender (encoder) have knowledge of the requisite nonverbal cues and the ability to encode them. However, it is important to realize that the circumstances surrounding the production of deliberate behavior are very different from those associated with

spontaneous behavior, as Ekman, Friesen, and Ellsworth (1972) have noted. For example, spontaneous encoding is modified by display rules (norms about encoding which tend to deintensify or mask the nonverbal expression), but deliberate encoding is not. Despite these differences in eliciting conditions, Ekman et al. argue that deliberate and spontaneous nonverbal cues are highly similar, if not identical. Zuckerman et al. (1976) appear to be in general agreement with this position and even suggest that "posed and spontaneous cues can be used interchangeably in decoding tasks [p. 976]." It would appear that the differential encoding conditions for spontaneous and deliberate behavior are of little import.

A closer examination of the processes involved during deliberate encoding suggests that the above conclusion is not really warranted. The deliberate encoder is cast into the role of performer and usually plays to an audience, but spontaneous encoding is immediate and elicited by the stimulus situation. The deliberate encoder must consider such factors as which cues to display, how to display the chosen cues, the audience's evaluation, and so on. Error can occur in (a) identifying the appropriate cues, (b) identifying the appropriate performance, and (c) encoding of the cues (due to inability or nervousness), etc. The additional cognitive processing required by deliberate encoding may alter the appearance of the overt nonverbal behavior.

Evidence pertinent to this contention comes from several sources. Miller (1972), commenting on the efficacy of role play vs. deception techniques in experimentation, has noted that deliberate behavior is not a satisfactory substitute for spontaneous responding. Main effects that are present with spontaneous behavior are replicated with deliberate

behavior, but subtler aspects of spontaneous encoding which are reflected in interactions among experimental variables may not occur in role playing. Earlier reports by Munn (1940) and Hunt (1941) agree with Miller's findings. Munn suggested that deliberate, posed expressions are not representative of normal, expressive behavior, and criticized Landis (1929) for using artificial (posed) stimuli. Munn (1940) showed that observers could accurately decode naturally-elicited stimuli. Hunt (1941) proposed that deliberate behavior, for the most part, is socially learned and should not be expected to resemble natural, spontaneous behavior. Finally, Allen and Feldman (Note 1), in an objective analysis of spontaneous and deliberate behavior, found that the patterning of the nonverbal responses was quite distinct in the two modes of encoding. For example, nonverbal responses that were almost nonexistent in the spontaneous behavior occurred frequently in the deliberate performance. Moreover, the deliberate encoding was characterized by "overacting" and by repetitive behavior.

The argument outlined above suggests that deliberate encoding may be substantially different from spontaneous encoding, particularly with respect to the patterning of the behavior. Previous investigators have ignored this aspect of the overt behavior and have simply asked observers to identify the emotion or expression being displayed. The problem with this approach is that the posed expression, which is consciously intended to transmit information, may be easily decoded and yet the deliberate behavior may not resemble spontaneous behavior. Zuckerman et al. (1976) and Allen and Atkinson (in press) have both reported that deliberate behavior is far more easily decoded than spontaneous behavior.

One must consider the naturalness or authenticity of the deliberate behavior (in addition to accuracy of identifying the expression) before concluding that spontaneous and deliberate behavior are highly related. This suggestion agrees with common sense: the professional actor who could not portray behavior in a natural, spontaneous manner would soon be unemployed.

The present study investigates perceived authenticity of behavior by asking observers to make simultaneous judgments of type of expression and also of naturalness of the behavior. Elementary school children were shown on a videotape listening to either an easy or a difficult lesson; and the encoding of easy/difficult was either spontaneous or deliberate. Therefore, some children displayed expressions of comprehension/non-comprehension naturally and others only pretended to comprehend or not comprehend the lesson. (All the children encoded all four conditions, but observers only saw a particular child display one type of behavior.) Observers were asked to indicate the expression (comprehension or non-comprehension) that each stimulus child was displaying, and also to indicate whether the behavior was spontaneous or deliberate. To the extent that (a) spontaneous and deliberate encoding depend on the same nonverbal cues, and (b) deliberate performance appears natural and spontaneous to an observer, the two modes of encoding should be related. Similar predictions can be made about the decoding of nonverbal behavior. If spontaneous and deliberate behavior appear similar to observers, then those observers who accurately decode one mode of encoding should also decode the other accurately. If the two modes of encoding do not resemble each other, then there would be no reason to

expect a relation between the decoding of spontaneous and deliberate behavior.

The present study also investigated the generality-specificity of another aspect of nonverbal behavior. In addition to the relation between spontaneous and deliberate encoding for a given type of nonverbal behavior, different content of nonverbal behavior can be related within a particular type of encoding. For example, a person who spontaneously encodes both happiness and fear with high accuracy would exhibit generality of encoding of content within the spontaneous mode of behavior. In a similar way for decoding, an observer who correctly identified role-played happiness, but was inaccurate in decoding role-played fear, would be situationally-specific in decoding content in the deliberate mode of behavior. Consideration of this second aspect of consistency is especially relevant in the present study because the two behaviors involved (understanding and not understanding) represent endpoints of a single dimension (level of comprehension) rather than being distinct dimensions (e.g., happiness and fear). If encoding skills are specific to a particular dimension, as opposed to particular behaviors, then the encoding of understanding and not understanding should be positively related. Similarly, the specificity of decoding skills can be determined empirically.

II

METHOD

Stimulus Materials

Stimulus materials for the present study were identical to those used by Allen and Atkinson (in press). Briefly, 16 fourth and fifth grade students (8 males and 8 females) from a small-town parochial school were videotaped while displaying each of four types of nonverbal behavior in response to a filmed lesson on electricity: (1) spontaneous comprehension: the lesson was very easy for the children and they were unaware that they were being filmed; (2) spontaneous non-comprehension: the lesson was very difficult for the children and they were unaware that they were being filmed; (3) deliberate comprehension: the children were told to pretend that they understood the lesson (which was very difficult); and (4) deliberate non-comprehension: the children were told to pretend that they did not understand the lesson (which was very easy).

Four different (silent) stimulus tapes were then prepared from the nonverbal behavior of these 16 stimulus persons in the following manner. Each child appeared once on each of the four tapes, but displayed a different type of nonverbal behavior on each tape. For example, a particular child would be shown portraying spontaneous comprehension on tape 1, deliberate non-comprehension on tape 2, deliberate comprehension on tape 3, and spontaneous non-comprehension on tape 4.

Stimulus order within and between tapes was randomized, subject to

two restrictions. First, mode of encoding (spontaneous or deliberate), degree of understanding (comprehension or non-comprehension), and sex of stimulus person were completely crossed within each stimulus tape. Thus, each type of nonverbal behavior was displayed four times; once by each of two males and once by each of two females. Second, within each stimulus tape, the same type of nonverbal behavior did not appear more than twice in succession. The resulting tapes showed 16 children, each of whom displayed one of four types of behavior. Each segment of behavior was approximately 2.5 minutes in duration and 10 seconds of blank videotape separated each segment.

Apparatus

The stimulus tapes were presented to subjects by means of a closed circuit television system that consisted of a Sony videotape recorder (model 3650) and an RCA Lyceum studio monitor (model number JR345B). An electrical signaling apparatus was employed to record the subject's responses. The apparatus had five answering booths that were separated from each other by plywood partitions. A bank of nine switches was located at the front of each booth. The first four switches from the left were used to record the subjects' decisions about the behavior displayed on the videotape. The four were labelled "natural & understanding," "natural & not understanding," "acting & understanding," and "acting & not understanding." Subjects' responses were recorded electronically in the adjoining room.

Judges

The judges (observers) were 40 undergraduates (20 males and 20 females) recruited from introductory psychology classes at the University

of Wisconsin, Madison. Participation partially fulfilled class requirements. These observers responded independently in same-sexed groups of two to five persons (depending upon availability).

Procedure

Judges were conducted to the experimental room and seated at the five booths. The experimenter explained to them that they would see 16, 2.5 minute silent videotapes, each depicting a child displaying one of four types of nonverbal behavior. Specifically, observers were informed that the children were either listening to an easy or a difficult lesson and, furthermore, that some of the children were behaving in a natural, spontaneous manner while others were acting and only pretending to understand or not understand the lesson. The observers' task was to decide which of the four types of behavior they had witnessed.

After familiarizing the judges with the use of the switches, the experimenter described the specific procedure to use in responding. Judges were told to watch each segment of videotape. At the end of each 2.5 minute segment, the experimenter stopped the videotape and asked the observers (by intercom from the next room) to indicate which type of behavior they believed they had witnessed by pressing the appropriate switch. After recording each response, the experimenter asked them to reset the switches for the next videotape segment. Observers were thoroughly debriefed at the conclusion of the experiment (approximately one hour in duration), thanked for their participation, and asked not to discuss the exact nature of the experiment with other potential participants.

Method of Analysis

Encoding. The 16 stimulus persons were assigned encoding accuracy scores based on the accuracy with which the observers decoded their non-verbal behavior. The encoding scores are frequency counts of the number of observers who correctly identified a particular stimulus person. A score was derived for each of the four types of behavior that the stimulus persons encoded. Three coding schemes were employed. First, the stimulus persons were assigned an encoding score only if observers identified both behavioral dimensions (mode of encoding and degree of understanding) correctly. Thus, an encoding score of 7 for a stimulus person who was spontaneously comprehending would indicate that seven observers had responded "natural & understanding" when asked to identify the type of behavior the stimulus person had displayed. For this precise accuracy measure, the encoding scores varied from 0 to 10, since 10 judges observed a particular stimulus person portraying a particular type of non-verbal behavior.

In a second coding scheme, stimulus persons were assigned encoding scores if observers identified at least the degree of understanding (comprehension or noncomprehension) correctly. For example, if the actual behavior being encoded was spontaneous comprehension, an observer's judgment was considered correct if he/she responded either "natural & understanding" or "acting & understanding." Finally, encoding scores were assigned on the basis of correct identification of at least the mode of encoding (spontaneous or deliberate). In the example given above (spontaneous comprehension), a correct response for this coding scheme was either "natural & understanding" or "natural & not under-

standing." These partial accuracy scores (which also varied from 0 to 10) were used to examine generality of encoding accuracy separately by each dimension of encoding. Of particular interest is the second coding scheme (comprehension accuracy). This dependent measure parallels that used by previous investigators: observers are usually asked merely to identify which expression they were viewing. Likewise, in deriving comprehension accuracy scores, only correct identification of the expression is considered. It is expected that spontaneous and deliberate encoding will be positively related on this measure.

Decoding. The 40 observers were assigned decoding accuracy scores, again using measures of precise and partial accuracy. The decoding scores are frequency counts of the number of videotape segments correctly identified by an observer in each of the four types of nonverbal behavior. The decoding accuracy scores varied from 0 to 4, since four stimulus persons displayed each type of nonverbal behavior. Precise and partial accuracy were assessed by employing the scoring techniques described in the previous section.

It should be noted that the distributions of encoding and decoding scores are not derived independently. Both data sets are obtained from the responses given by the decoders. Unfortunately, this interdependence cannot be circumvented; encoding accuracy must be measured by another person's perception of the behavior. An objective criterion, even if one could be developed, would depend upon subjective judgment at some point.

III

RESULTS

Encoding

The three measures of encoding accuracy (precise, comprehension, and mode of encoding) each reflect a different facet of encoding. Consequently, predictions concerning the strength and direction of the relation between the various encoding scores will vary with each measure of encoding accuracy. These expectations will be presented before discussing each of the analyses. For all three measures of encoding accuracy, the relation between each of the four types of nonverbal behavior was examined by using Pearson's r .

Analysis of the comprehension accuracy scores was expected to produce findings consistent with previous research. An observer's responses were considered accurate if at least the nonverbal expression (comprehension or noncomprehension) was correctly identified. Spontaneous encoding of comprehension was expected to be positively related to the deliberate encoding of comprehension. A similar result was expected for the spontaneous and deliberate encoding of noncomprehension. Results of the correlational analysis are shown in Table 1. Only one of the correlations reached significance: spontaneous comprehension with spontaneous noncomprehension, $r(15) = -.52$, $p < .04$. Stimulus persons who naturally encoded comprehension accurately did not encode noncomprehension accurately, and vice versa. There was also a negative relation

(though not significant) between these two types of behavior when the stimulus persons encoded deliberately. Correlations for the two between-mode comparisons (spontaneous comprehension with deliberate comprehension and spontaneous noncomprehension with deliberate noncomprehension) were low, but at least in the expected (positive) direction.

The precise accuracy measure considers not only the identification of the level of understanding, but also the naturalness or perceived authenticity of the behavior. To the extent that an individual deliberately encodes behavior in a manner that appears spontaneous and natural, deliberate encoding will be related to spontaneous encoding. Consistent accuracy in between-mode encoding will be reflected by negative correlations, and consistent inaccurate encoding by positive correlations. This is due to the fact that the encoding scores are derived from the decoder's responses. Thus, highly consistent encoders are those stimulus persons who accurately decode during spontaneous behavior and poorly decode while role playing, which implies that the deliberate performance appeared spontaneous and natural to the observers. Consistent results within a particular mode of encoding will be reflected in the typical manner, i.e., positive correlations are indicative of generality of encoding behavior and negative correlations are indicative of specificity of encoding.

Results for the precise accuracy analysis are shown in Table 2. As can be seen, none of the correlations reached acceptable levels of significance. The correlations for the within-mode comparisons (A with B, C with D) were somewhat lower than in the first analysis but are still negative, indicating specificity in encoding. Lack of generality is also

TABLE 1

CORRELATIONS FOR ENCODING: COMPREHENSION ACCURACY

Nature of Behavior		A	B	C	D
Spontaneous comprehension	(A)	-			
Spontaneous noncomprehension	(B)	-.52*	-		
Deliberate comprehension	(C)	.17	-.41	-	
Deliberate noncomprehension	(D)	-.17	.27	-.28	-

* $p < .04$

N = 16

TABLE 2

CORRELATIONS FOR ENCODING: PRECISE ACCURACY

Nature of Behavior		A	B	C	D
Spontaneous comprehension	(A)	-			
Spontaneous noncomprehension	(B)	-.28	-		
Deliberate comprehension	(C)	-.03	.11	-	
Deliberate noncomprehension	(D)	-.40	.38	-.11	-

N = 16

demonstrated in the between-mode comparisons (A with C, B with D). Spontaneous encoding of comprehension was not at all related to the deliberate production of comprehension. Moreover, the correlation between spontaneous and deliberate noncomprehension was positive, indicating that the children were not acting in a manner that looked spontaneous and natural.² However, all trends shown in Table 2 were statistically unreliable.

The third accuracy measure, mode of encoding accuracy, provides a more general examination of the within-mode comparisons. It is expected that encoding accuracy should be highly related within a given mode of encoding: that is, spontaneous behavior should be encoded similarly regardless of the level of understanding involved. For the between-mode comparisons, negative correlations reflect similarity of encoding behavior as with the precise accuracy measure. Results are shown in Table 3. All the correlations were nonsignificant but in the expected directions, indicating a modicum of between- and within-mode generality.

With one exception (spontaneous comprehension with spontaneous noncomprehension, Table 1), the correlational analyses on all three measures of encoding accuracy indicated that there was virtually no relation between encoding abilities on various types of nonverbal behavior. This is somewhat surprising. It is possible that the result may be due to statistical considerations. First, the number of encoders was small (16), and correlational techniques usually require larger sample sizes to produce reliable results. Second, the distributions of accuracy scores were often truncated, particularly with the partial accuracy measures, and correlations involving distributions with truncated

TABLE 3
CORRELATIONS FOR ENCODING: MODE OF ENCODING ACCURACY

Nature of Behavior		A	B	C	D
Spontaneous comprehension	(A)	-			
Spontaneous noncomprehension	(B)	.19	-		
Deliberate comprehension	(C)	-.38	.20	-	
Deliberate noncomprehension	(D)	-.35	-.11	.32	-

N = 16

ranges often produce spurious results. Consequently, a nonparametric statistic was employed to re-evaluate the relation between the various types of nonverbal behavior.

For each measure of encoding accuracy, each of the four distributions of accuracy scores (one for each type of behavior) was split at the median. Those stimulus persons whose encoding scores fell above the median were designated as high-accuracy encoders, and those below as low-accuracy encoders. Stimulus persons with scores falling at the median were randomly designated as being high or low in accuracy. The distributions of high and low accurate observers were then compared in 2-way contingency tables. The following four comparisons were conducted using the Pearson Chi-square test for independence: (a) spontaneous comprehension with deliberate comprehension, (b) spontaneous noncomprehension with deliberate noncomprehension, (c) spontaneous comprehension with spontaneous noncomprehension, and (d) deliberate comprehension with deliberate noncomprehension. All 12 comparisons (four for each of the accuracy measures) were nonsignificant, indicating that encoding abilities for the various types of nonverbal behavior were not related.

Decoding

The generality-specificity of observers' accuracy in identifying the various types of nonverbal behavior was assessed by correlations among the decoding scores. As with the encoding analysis, three measures of decoding accuracy were used: comprehension accuracy, precise accuracy, and mode of encoding accuracy. For each of these three analyses, positive correlations reflect generality decoding behavior.

We argued earlier that analysis of the comprehension accuracy scores should closely parallel the results obtained by previous researchers. Observers merely had to identify whether the stimulus persons appeared to be understanding or not understanding the lesson. It was expected that the correlations for both within- and between-mode behavior would be large and positive. The correlation matrix is shown in Table 4. It can be readily seen that none of the correlation coefficients were large; in fact, all the coefficients were nonsignificant. Furthermore, the within- and between-mode comparisons were negative instead of positive. No evidence for generality of decoding accuracy was found in the comprehension accuracy analysis.

Results for the analysis of precise accuracy and mode of encoding accuracy are shown in Tables 5 and 6, respectively. In both cases, a significant negative relation was found between spontaneous noncomprehension and deliberate comprehension. Observers who were accurate in decoding spontaneous noncomprehension were inaccurate in decoding deliberate comprehension, and vice versa. Unfortunately, these comparisons reflect both within- and between-mode differences, making interpretation difficult. Since the present study was concerned only with comparisons that are completely between or completely within, these results will not be discussed further. All the other correlation coefficients shown in Tables 5 and 6 were nonsignificant.

One final attempt was made to assess decoding consistency. The distributions of decoding accuracy scores were not subject to the same statistical problems found in the encoding accuracy scores. The sample size was sufficiently large ($N = 40$), and the scores covered the

TABLE 4
CORRELATIONS FOR DECODING: COMPREHENSION ACCURACY

Nature of Behavior		A	B	C	D
Spontaneous comprehension	(A)	-			
Spontaneous noncomprehension	(B)	-.11	-		
Deliberate comprehension	(C)	-.10	.01	-	
Deliberate noncomprehension	(D)	.15	-.26	-.07	-

N = 40

TABLE 5
CORRELATIONS FOR DECODING: PRECISE ACCURACY

Nature of Behavior		A	B	C	D
Spontaneous comprehension	(A)	-			
Spontaneous noncomprehension	(B)	.14	-		
Deliberate comprehension	(C)	-.06	-.53*	-	
Deliberate noncomprehension	(D)	-.18	-.11	.03	-

* $p < .001$

N = 40

TABLE 6
CORRELATIONS FOR DECODING: MODE OF ENCODING ACCURACY

Nature of Behavior		A	B	C	D
Spontaneous comprehension	(A)	-			
Spontaneous noncomprehension	(B)	.24	-		
Deliberate comprehension	(C)	-.01	-.42*	-	
Deliberate noncomprehension	(D)	-.24	.08	.05	-

* $p < .007$

N = 40

entire range possible for each measure of decoding accuracy. However, this range itself was quite limited (0-4) and, therefore, is functionally a truncated range. To overcome this problem, a more general coding scheme was employed. Using the comprehension accuracy scores, the distributions for spontaneous comprehension and deliberate comprehension were summed to produce a score (ranging from 0 to 8) that reflected decoding accuracy for comprehension, regardless of the mode by which the behavior was encoded (spontaneous/role play). Similarly, a noncomprehension decoding score was derived by summing scores for spontaneous noncomprehension with scores from deliberate noncomprehension. General decoding scores for spontaneous accuracy and deliberate accuracy were obtained in an analogous manner from the distributions for mode of encoding accuracy. Generality of decoding accuracy was then assessed by correlating spontaneous accuracy with deliberate accuracy, and the general comprehension accuracy with the general noncomprehension accuracy. Neither comparison resulted in a significant correlation, but there was a slight trend ($r = -.25$) observed in the general spontaneous/deliberate analysis. Observers who decoded spontaneous behavior accurately tended to do poorly with deliberate behavior, and vice versa. A complete lack of relation was found in the general comprehension/noncomprehension analysis ($r = .01$).

IV

DISCUSSION

The present study was designed to investigate alternative theoretical positions concerning the relation between spontaneous and deliberate nonverbal behavior. Contrary to expectation, no support for the generality of encoding or decoding accuracy was found in any of the analyses. If anything, the data suggested a negative relation between performance on spontaneous and deliberate behavior: between-mode negative relations were found in four of the six encoding comparisons (Tables 1-3) and five of the six decoding comparisons (Tables 4-6). Within-mode inconsistency was also observed when stimulus persons encoded spontaneously (Table 1), but the effect disappeared when the perceived authenticity of the behavior is taken into account (Table 2). Overall, the results indicate that the ability to encode or decode one type of nonverbal behavior appears to be completely unrelated to performance with another type of nonverbal behavior.

The results for between-mode accuracy stand in marked contrast to previously reported results. In particular, Zuckerman et al. (1976) found a large positive relation between spontaneous and deliberate behavior for both encoding and decoding. Let us consider possible methodological differences between the present study and that of Zuckerman et al. that may account for the discrepant results.

Zuckerman et al. used college students in both the encoding and decoding phases of their study. In the present study college students were

the decoders, but the encoders were elementary school children. Children may differ from adults in the way they encode nonverbal behavior, and adults may decode the nonverbal behavior of children and adults in a different manner. Consequently, lack of agreement (on the comprehension accuracy measure) between the present study and the findings of Zuckerman et al. may be due to the different ages of the encoders. But this explanation is in conflict with the reports of Buck (1975) and Allen and Atkinson (in press). Buck demonstrated a positive (but small) relation between children's encoding of spontaneous and posed expressions when college students were used as decoders. And Allen and Atkinson found that college students could differentiate between various types of nonverbal behavior in children. Therefore, difference in the age of encoders does not account for the conflicting findings across studies.

A second possible explanation lies in the nature of the nonverbal behavior that was encoded. Zuckerman et al. (and most other authors) asked subjects to encode various emotional expressions (e.g., happiness and fear). In the present study the children encoded facial expressions indicative of comprehension or noncomprehension of a lesson. Perhaps the nonverbal behavior used in the present study was too subtle for observers to decode reliably. Evidence contrary to this suggestion comes from the Allen and Atkinson study (in press), which showed that observers could significantly discriminate between expressions of comprehension and noncomprehension for both spontaneous and deliberate behavior. Moreover, Allen and Atkinson's stimulus tapes were identical to those in the present study. Clearly, nonverbal expressions indicative of comprehension or noncomprehension, as well as emotional expressions, can be

accurately decoded.

Excluding the possibility of systematic differences in subject populations, a more parsimonious explanation for the discrepancies between the findings of the present study and that of Zuckerman et al. (1976) may be found in two fundamental differences between them. First, Zuckerman et al. used the same subjects to encode and decode the behavior. Consequently, their observers were "primed" or sensitized during the decoding sessions; that is, they were familiar with the nonverbal stimuli since they had previously encoded the expressions themselves. Experience during the encoding session may have provided additional information when decoding, e.g., expectation of a particular nonverbal style, ability to imagine circumstances surrounding the encoding, etc. In addition, the observers were informed about the true nature of the study. Thus, they may have been highly motivated to be accurate when decoding, that is, to comply with implicit experimenter demands. In contrast, encoders and decoders were different persons in the present study. The observers had not been sensitized since they had no previous experience with the stimulus tapes. Post-experimental questioning revealed that none of the observers were aware of the actual purpose for the experiment. Interestingly, the problem of sensitization also exists in Buck's (1975) study (as mentioned earlier) and, therefore, it is also unclear whether Buck's results would apply to the naive observer.

The second difference involves the type of decoding task required of the observers. At the outset of this paper, we argued that a factor of "perceived authenticity" must be considered in judgments of deliberate behavior before an adequate conclusion can be drawn about the relation

between spontaneous and deliberate behavior. Accordingly, observers in the present study were asked to decode each stimulus person's behavior on two dimensions, viz., the expression displayed (degree of understanding) and the perceived authenticity (mode of encoding). Zuckerman et al. and previous authors have asked for judgments only on the former dimension. We anticipated that the dimensional judgments would be independent of each other: deciding that a stimulus person was behaving spontaneously (or deliberately) should not affect the judgment concerning understanding and vice versa. This may not have been the case. For example, if an observer decides that a stimulus person is deliberately encoding, the set of behaviors indicative of comprehension or noncomprehension may be very different from the set used in judging spontaneous behavior. A different type or intensity of head nod may be required, subtler cues such as drifting attention may be sought, and so on. Furthermore, a shift in the observational set may be effective (i.e., produce accurate decoding) for some types of nonverbal behavior, and ineffective for others. This shift will tend to "average out" observer accuracy across the various types of nonverbal behavior, resulting in low intercorrelations between the distributions of accuracy scores.

Zuckerman et al. (1976) reported high positive correlations between spontaneous and deliberate behavior for both encoding ($\bar{r} = .46$) and decoding ($\bar{r} = .58$). Using the comparable comprehension accuracy measure in the present study, a low positive correlation was found for encoding consistency (mean $\bar{r} = .22$) and a low negative correlation for decoding consistency (mean $\bar{r} = -.18$). Taken together, the above methodological considerations suggest that the discrepancy in results is due to

inflated results in the Zuckerman et al. study because of sensitization, and deflated results in the present study because of shift in the observation set.

Moreover, the "set shift" notion predicts a differential discrepancy for encoding and decoding consistency. For each type of nonverbal behavior, a given encoder's performance is constant for all observers. If the stimulus child's behavior elicits a shift in observational set, the shift should occur with all observers and there should be some degree of interobserver agreement. Thus, regardless of how the shift affects observer accuracy for the various types of behavior, the obtained results for encoding consistency will be only moderately deflated. In contrast, decoding consistency should be maximally affected by a shift in observational set. The different types of behavior may elicit different kinds (quantitatively or qualitatively) of set shift which might facilitate or inhibit accurate decoding. A shift may not occur at all. Therefore, variance in observer accuracy across the types of behavior will be maximized, resulting in low interbehavioral correlations. In sum, the set shift explanation predicts a much larger discrepancy for decoding consistency than for encoding consistency. The data support this prediction. The discrepancy between the present study and the Zuckerman et al. study is .24 in encoding consistency, and .40 in decoding consistency (absolute values).

It was quite surprising to find such strong situational specificity in the present study. In fact, the only significant correlations were negative. These findings suggest that the social and cognitive abilities involved in encoding and decoding are highly specific. Persons skilled with one type of behavior tend to be unskilled with another type of be-

havior. Such a conclusion is reasonable for encoding abilities. As we noted in the introduction, encoding skills involved with deliberate behavior are vastly different from those associated with spontaneous behavior. Deliberate behavior may represent, as Hunt (1941) suggests, no more than a person's expectations of what the behavior should look like and may bear no resemblance to his or her spontaneous behavior. A similar argument can be advanced for within-mode encoding behavior. Understanding and not understanding may not represent end points on a continuum of level or comprehension, as we initially suggested. Instead very distinctive behaviors seem to be involved when encoding these two expressions. To portray "not understanding," the encoder must do more than simply refrain from encoding cues indicative of understanding. For example, it is insufficient to avoid nodding the head; the encoder must shake his/her head as well.

It is more difficult to explain why decoders tend to be situation-specific in their accuracy, especially when viewing deliberate behavior. When the stimulus persons are role playing the cues are exaggerated, as Allen and Feldman (Note 1) have reported. It should be relatively easy to identify correctly at least the level of comprehension for both understanding and not understanding. This does not seem to be the case however, as shown in Table 4. All four within- and between-mode correlations were negative, indicating inconsistency in the decoding accuracy.

Instead of concluding that decoding abilities are highly specific, an alternative explanation is offered by considering the decoding strategy an observer adopts when viewing the stimulus tape. For example, an observer may decide to make the spontaneous/deliberate judgment first,

and then to decide whether the child is understanding or not understanding. This strategy may work well if it is easy to make the spontaneous/deliberate distinction. When this distinction is not easy to make, the observer may watch the entire behavior segment and still be unable to reach a conclusion (assuming that the observer does not change the decoding strategy). Furthermore, making an initial spontaneous/deliberate decision may elicit the shift in observation set that was discussed earlier. Depending on the type of behavior, a set shift may facilitate or inhibit accurate decoding. Therefore, the predominance of negative correlations found in the present study is most likely due to observers adopting a rigid decoding strategy and not attributable to highly specific encoding/decoding skills. (Note that these comments apply to both encoding and decoding results since the encoding scores are derived from the decoders' responses.)

We have attempted to reconcile the discrepancy between the present results and the findings of previous authors by considering fundamental methodological differences. Both the studies of Buck (1975) and Zuckerman et al. (1976) are subject to the criticism of observer sensitization, and it is unclear whether their results would be obtained with more naive observers. The present study avoided the sensitization problem, but results may be deflated due to certain observer decoding strategies (and set shift). In our opinion, these decoding strategies are not artifacts of the experimental situation. When attempting to understand behavior in the real world, observers are probably not so myopic as to consider only one dimension (e.g., type of expression) of the behavior. Indeed, observers probably employ several dimensions

(e.g., type of behavior, spontaneous/deliberate, intensity, purpose, etc.) to arrive at a final decision. Future research might profit by examining the types of decoding strategies adopted by observers or by attempting to establish independent estimates of encoding accuracy. Until these processes are better understood, it would be most unwise to accept Zuckerman et al.'s suggestion concerning the substitutability of spontaneous and deliberate nonverbal behavior. Deliberate behavior may be partially related to spontaneous behavior, but deliberate behavior is by no means identical to spontaneous behavior.

REFERENCE NOTES

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FOOTNOTES

¹During spontaneous encoding subjects were only videotaped during the final 15 seconds of each scene. Therefore, to control for content in the deliberate encoding only the final 15 seconds of each scene was described to the subjects. Subjects also posed each reaction for 15 seconds.

²An examination of decoding errors is necessary to test adequately the precise accuracy predictions. For example, an individual who was decoded well during spontaneous behavior and poorly during deliberate behavior would produce a negative correlation, indicating lack of generality in encoding accuracy. The inaccurate decoding during deliberate behavior could result from an incorrect identification of the mode of encoding, the level of understanding, or both. To assert that the inaccurate decoding was a function of the encoder's behavior appearing to be spontaneous, one must demonstrate that decoding errors occurred on the mode of encoding dimension only. In view of the non-significant findings for precise accuracy, the examination of decoding errors will not be discussed further.

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